# Data Services: Making It Happen

Heather Coates, Stacy Konkiel, Michael Witt

ACRL 2013: April 12, 2013



# Agenda

- Panel Introductions
- Back to the 80s
- The data challenge
- Data Services: In 6 Acts
- Discussion

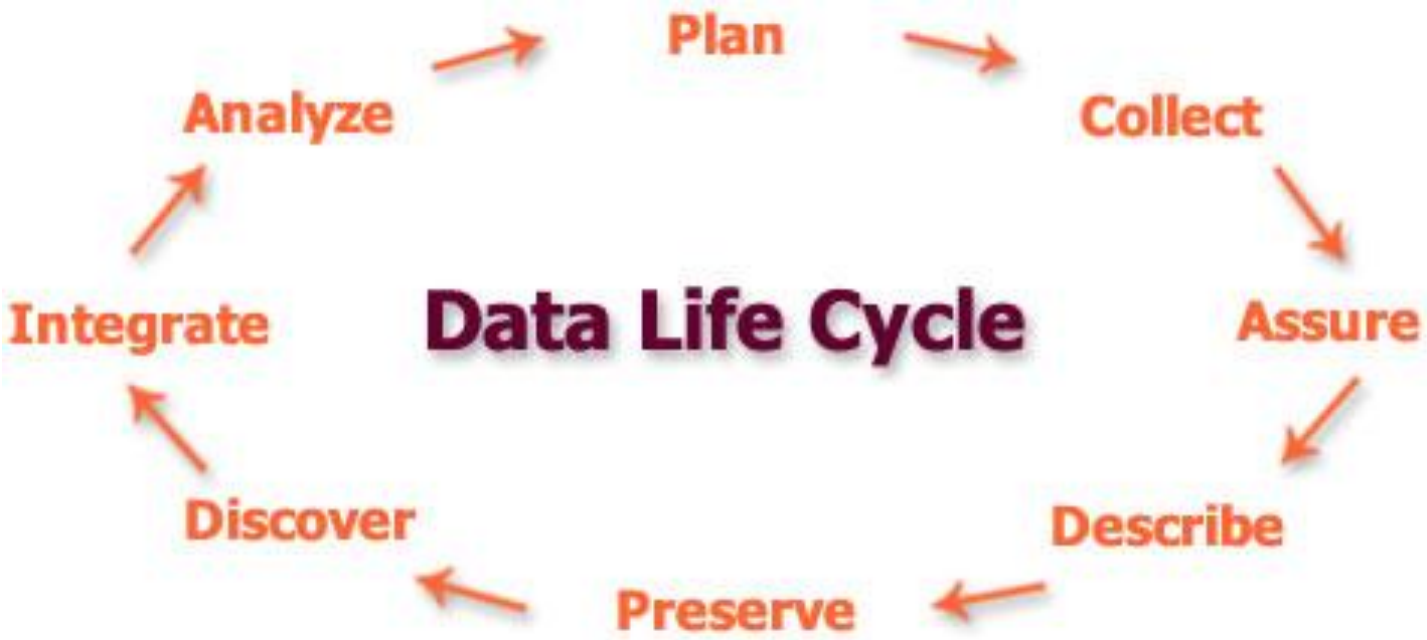
# The data challenge

- The data deluge: Volume, Velocity, Variety
- Privacy & security concerns
- Digital data vs. analog data
- Making sense of it: discovery, access, & reuse
- The case for Open Data
- The Academy responds

# Why librarians should get involved

- Trust
- Interdisciplinary/Collaborative
- Existing Infrastructure
  - Preservation
  - Digital Content

# Data Life Cycle

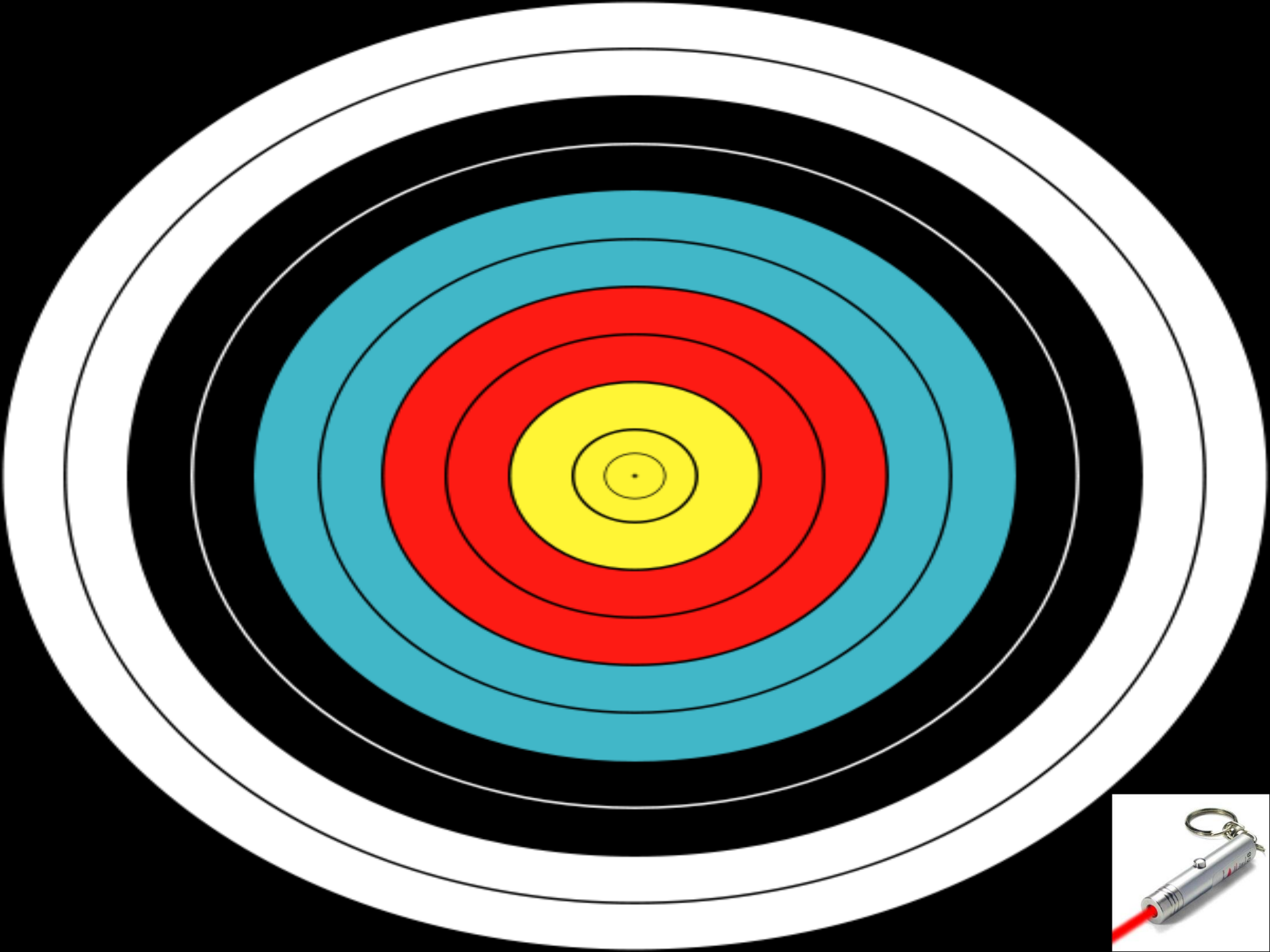



Source: http://www.dataone.org/best-practices

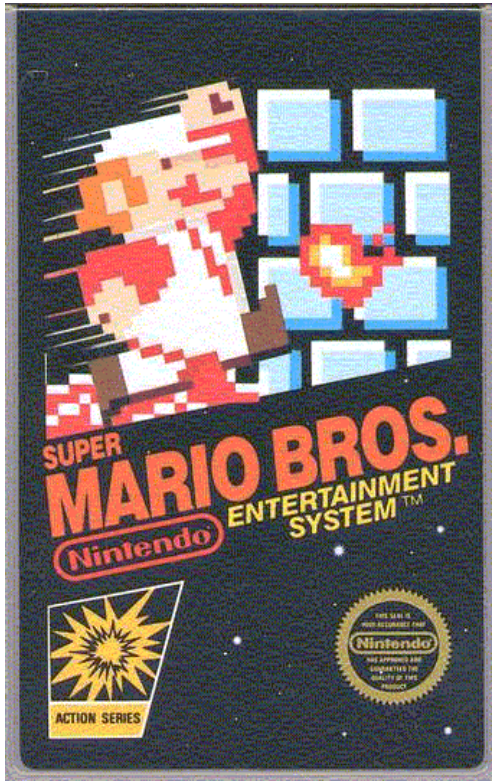
*It's about supporting research, at all phases of the life cycle*

# Data Services: In 6 Parts

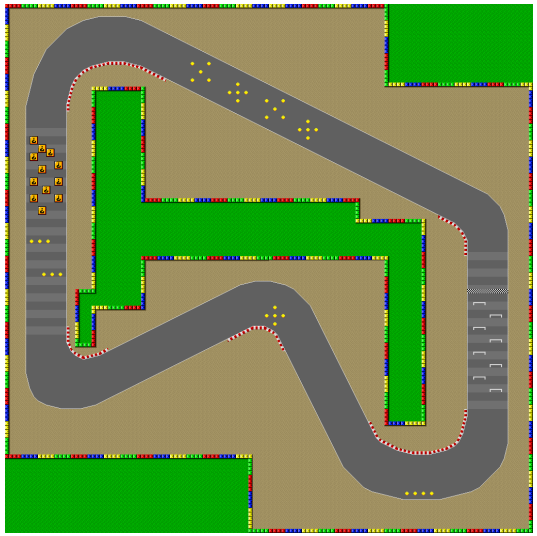
- Consultations [Heather]
- Training [Heather]
- Metadata & Documentation [Stacy]
- Preservation [Stacy]
- Institutional Repositories [Mike]
- Data Citation [Mike]



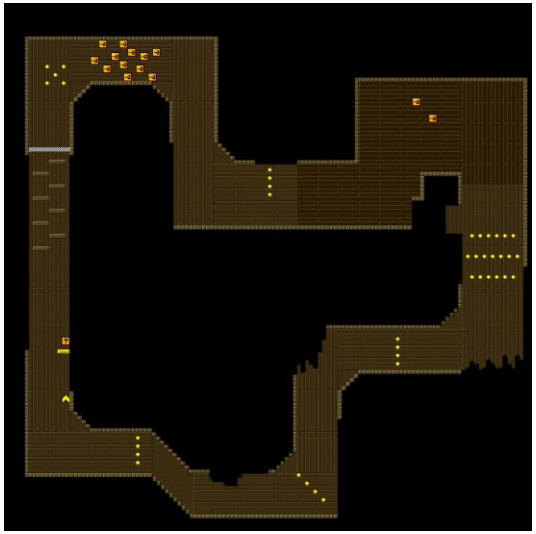

MARIO KART 64
NINTENDO 64
KIDS TO ADULTS
K-A
CONTENT RATED BY
ESRB
Nintendo
NUS-006 (USA)
NUS-NKTE-USA


SUPER
MARIO BROS.
ENTERTAINMENT
SYSTEM
Nintendo
ACTION SERIES

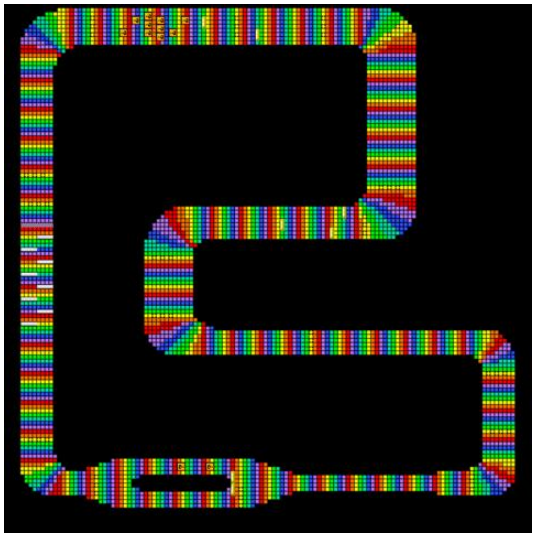
# Data Services Routes



Mario Circuit 1

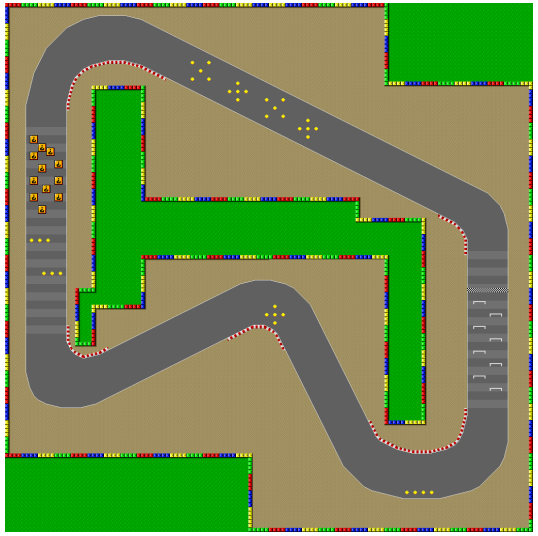


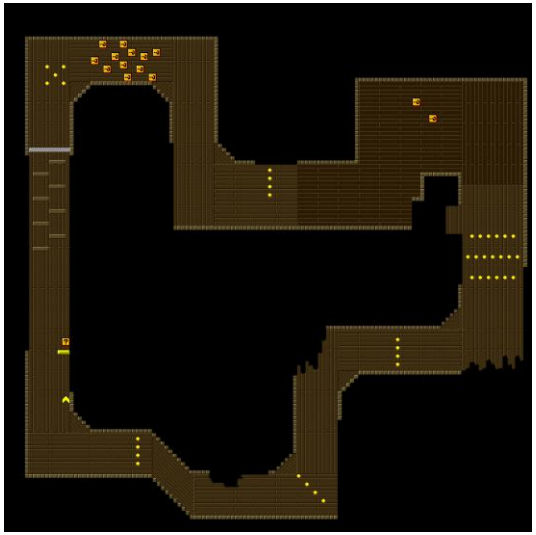
Ghost Valley 2

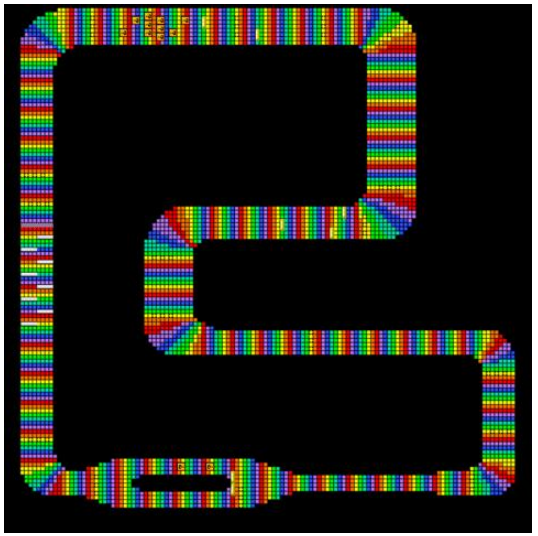


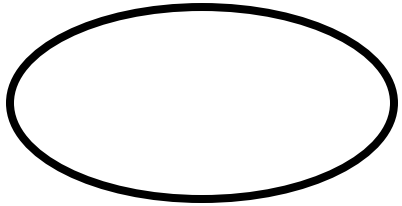
Rainbow Road

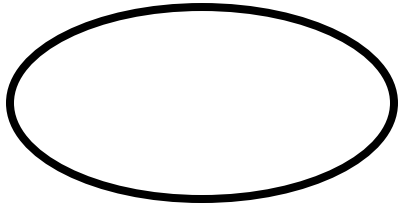
# How adventurous do you feel?

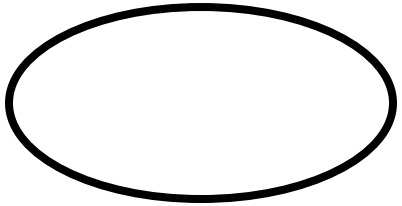












**Mario Circuit 1: Well-tread, safe, smooth**

**Ghost Valley 2: Bumpy, guard rails**

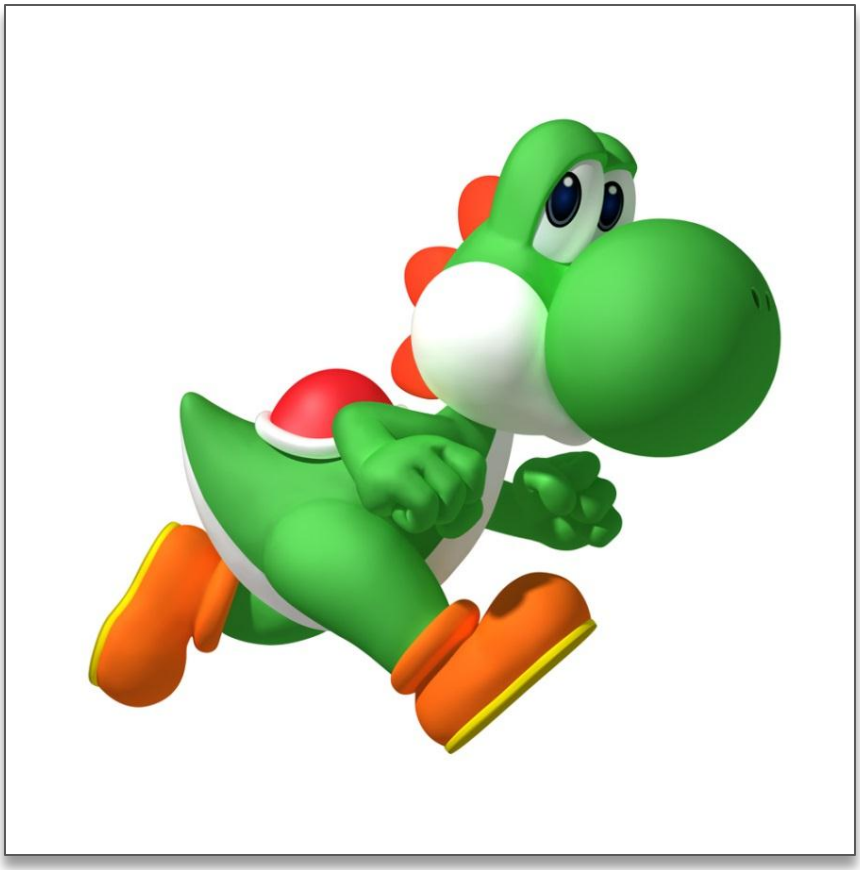
**Rainbow Road: Sharp turns, no rails, hard to see**

Data management plans are great!

Ugh, more administrative overhead…

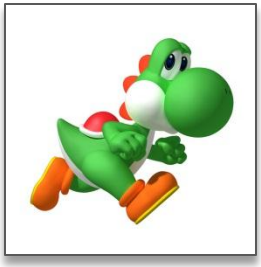
# Consulting - Be like Yoshi

- Help overcome obstacles
- Navigate unfamiliar & difficult territory
- Be a good sidekick…but don’t let Mario sacrifice you to win!



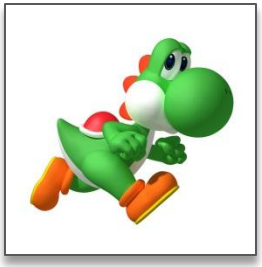
# What happens during a consult?

- Meeting the funding agency requirement
  - Gather info for draft or review and refine DMP
- Culture change
  - *Nudge* towards institutional cyberinfrastructure
  - *Suggest* better data management practices
  - *Encourage* use of IR for dissemination
  - Navigating the system - referral to other units



# Data management plans

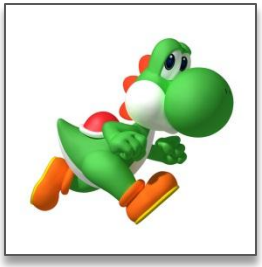
- Describing data
- Defining standards
- Intellectual property and rights management
- Licensing
- Archiving and preservation



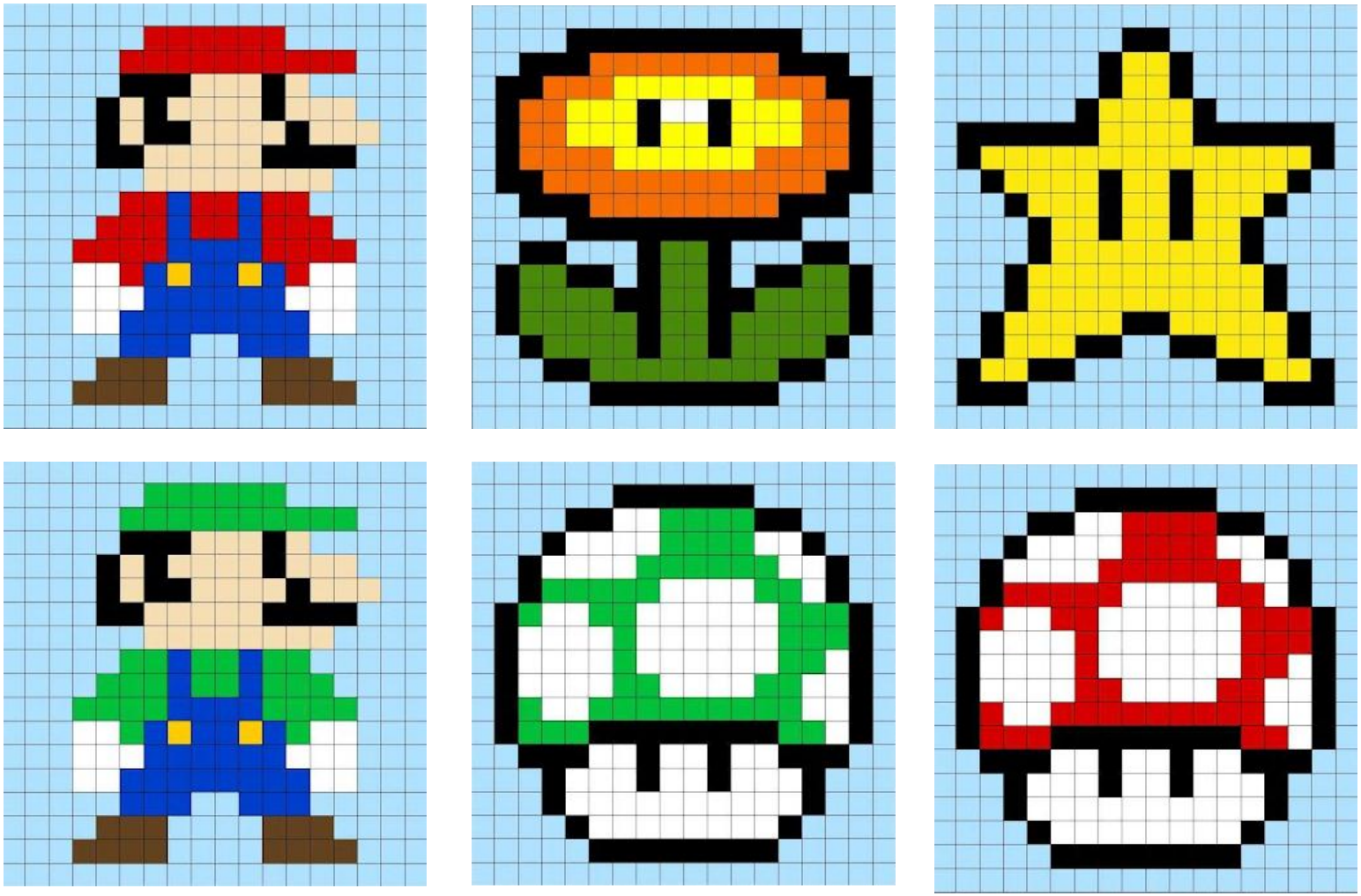
# Strategies for success


# What path to take?

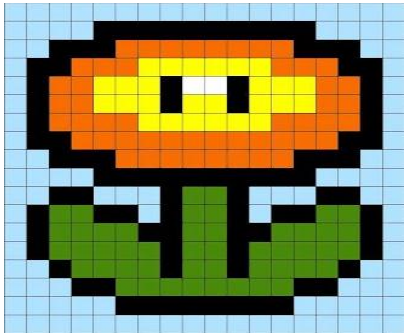
- Mario Circuit 1: The beaten path
- Ghost Valley 2: Moderately rough terrain
- Rainbow Road: Uncharted territory

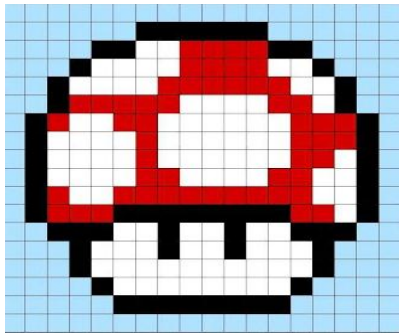


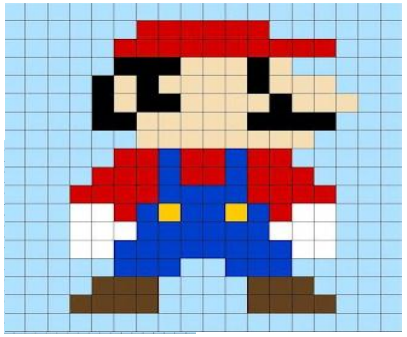
# Data Management Training



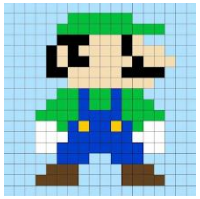
# Training: Skills boost







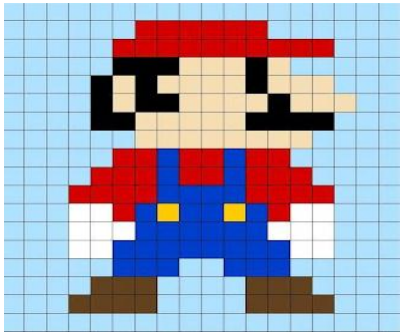
- Identify skills gaps
- Build on existing efforts
- Collaborate
- Relate it back to the mission
- Evaluate & assess
- Revise and refine



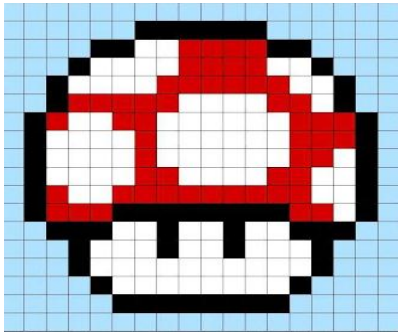
# What level of training do you offer?

## Data management plans & planning

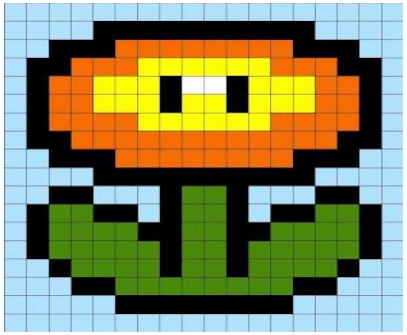
Basic



Moderate



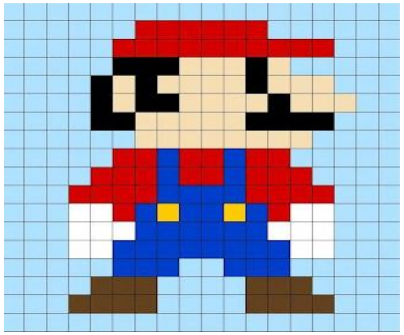
Advanced



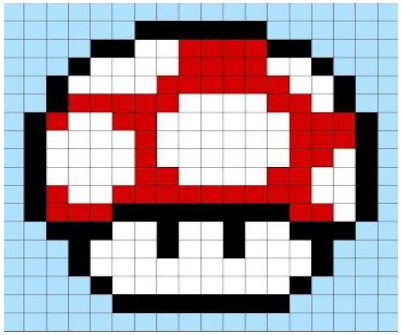
# What level of training do you offer?

## File organization & naming

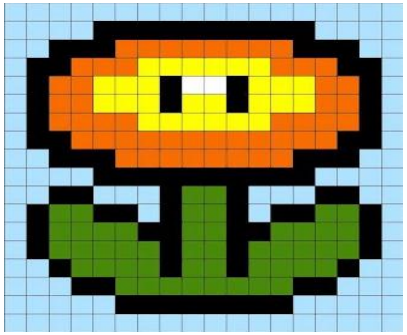
Basic



Moderate



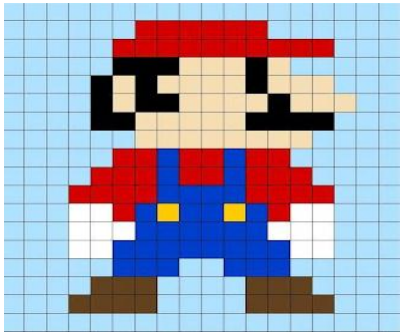
Advanced



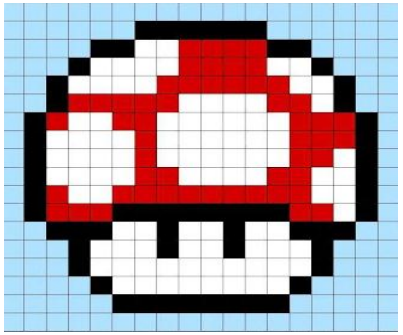
# What level of training do you offer?

## Backup & storage

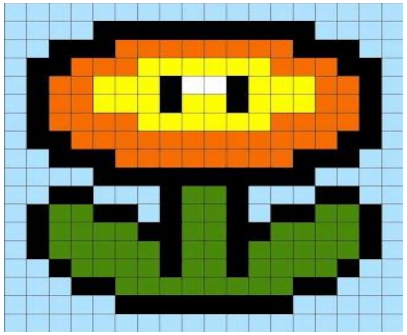
Basic



Moderate



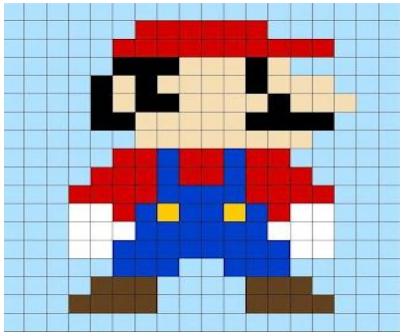
Advanced



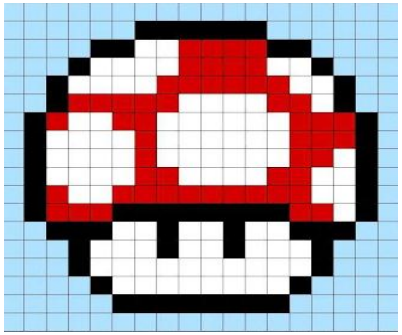
# What level of training do you offer?

## Documentation & metadata

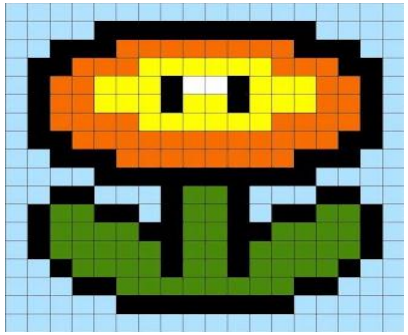
Basic



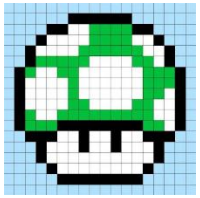
Moderate

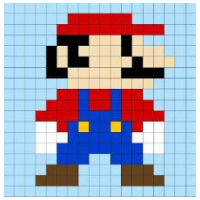


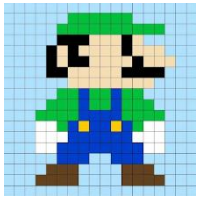
Advanced



# Training: Various contexts

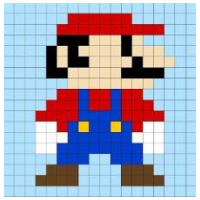
- Scholarly communication
- Preservation & curation 
- Responsible Conduct of Research (RCR)

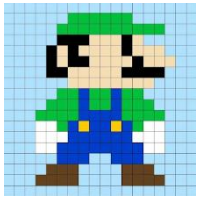




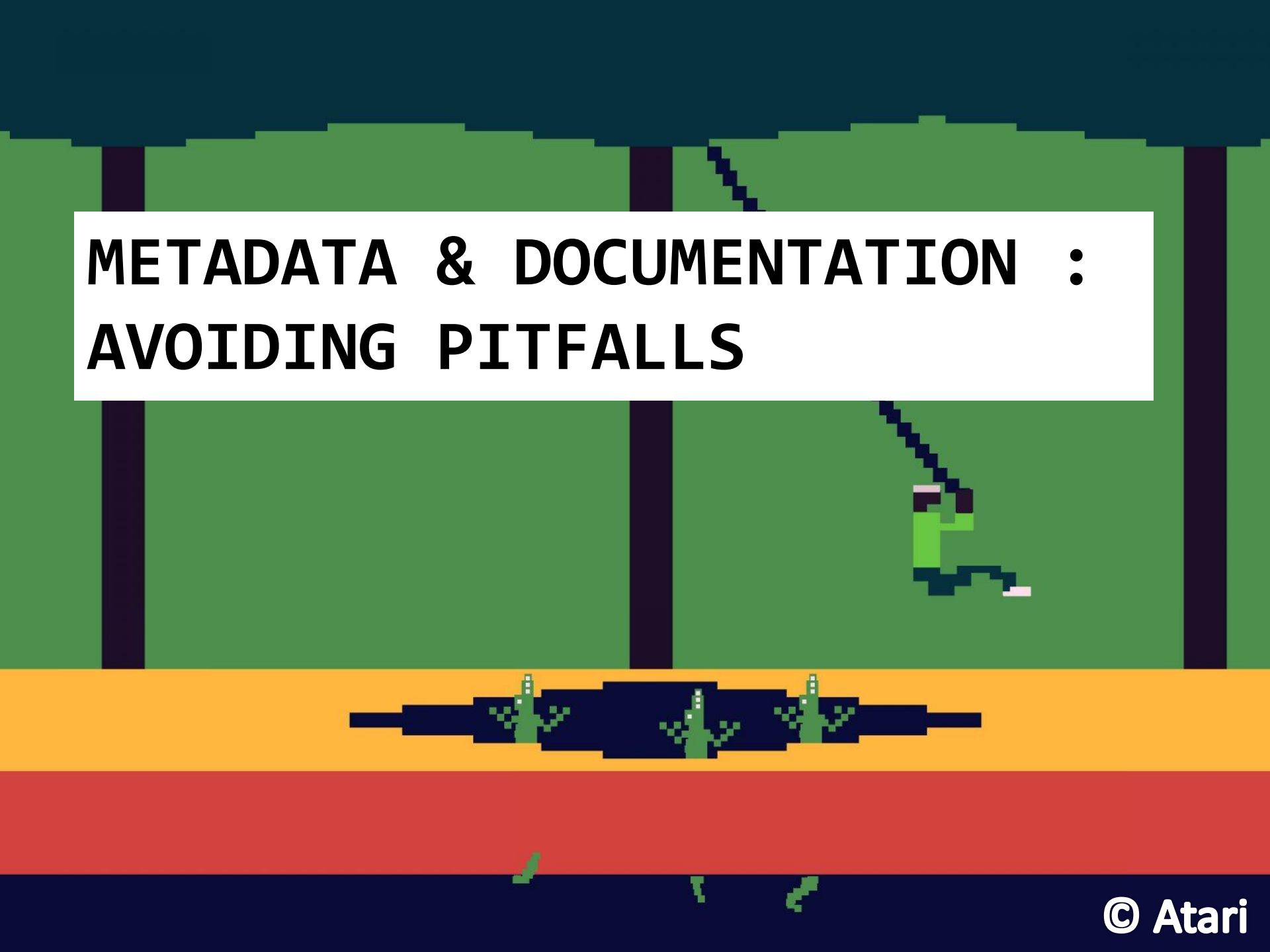
# Training: Strategies

- Make it relevant to expressed/identified needs
- Focus on the practical & concrete
- Demonstrate strategies
- Provide opportunities to practice on examples
- Use real-world datasets
- Target to discipline or research approach



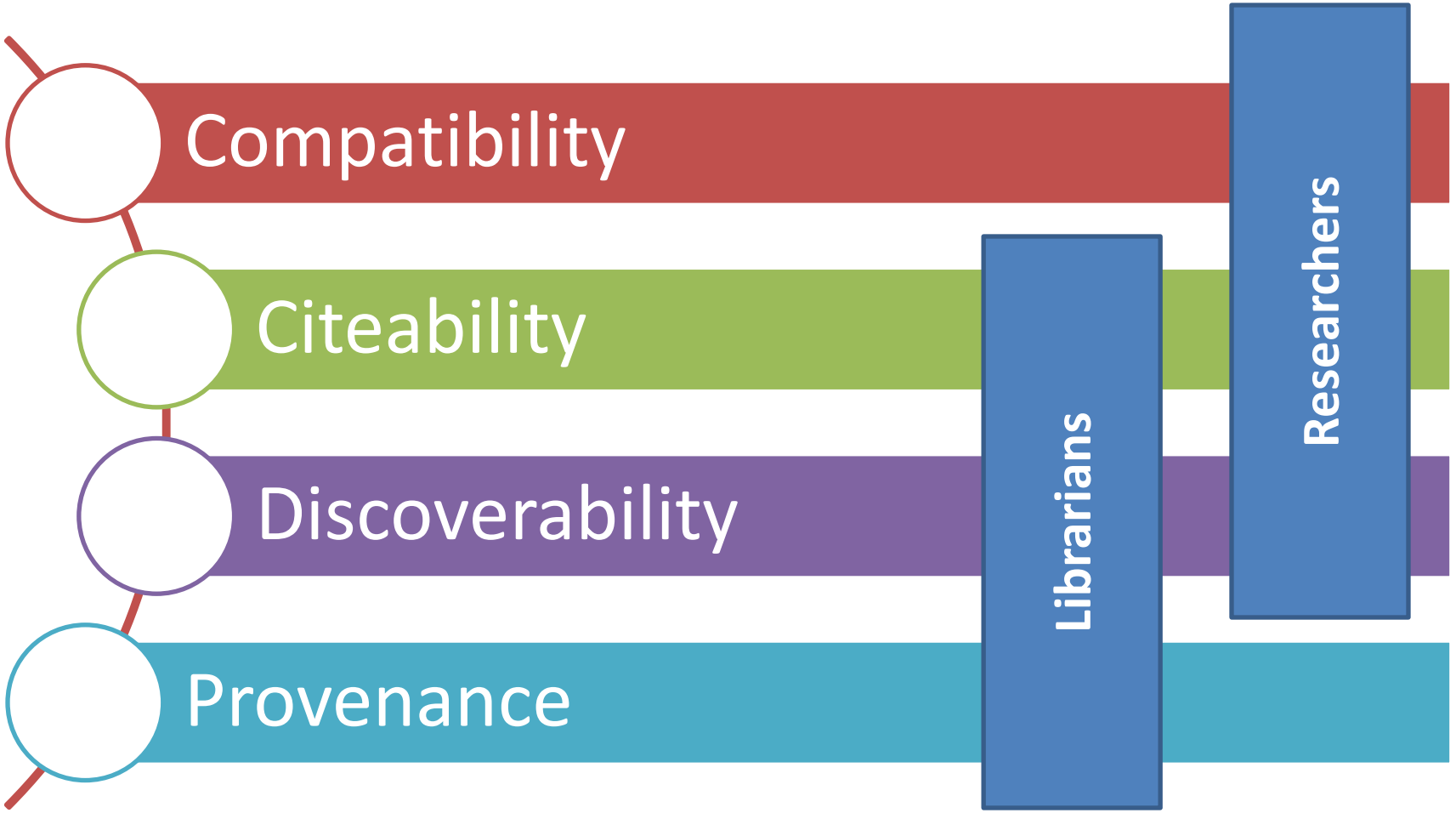


# METADATA & DOCUMENTATION : AVOIDING PITFALLS



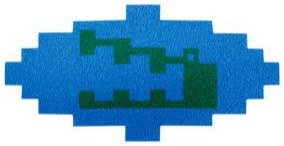
# The Big Question

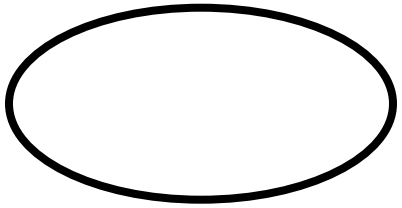
## Metadata: Who Cares?



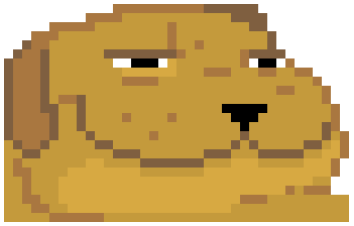
# Things I would rather do than think about scientific metadata:

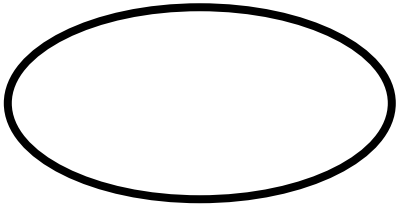
- **Fight a pit of crocodiles**



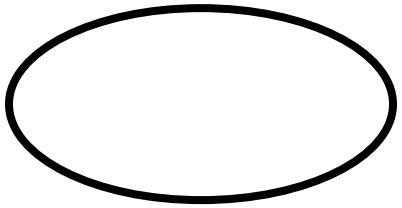


- **I’m neutral.**

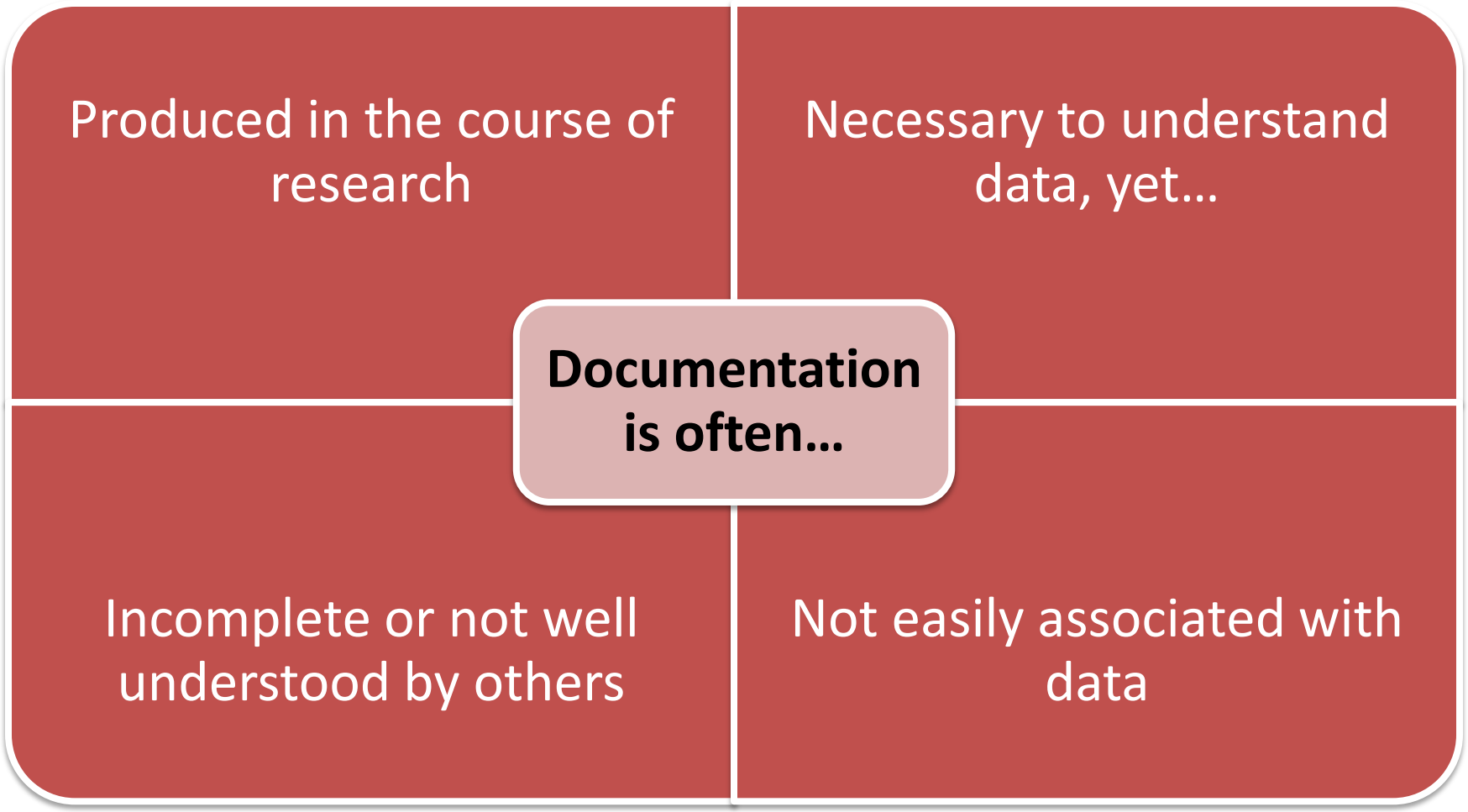




- **Nothing! It’s very rewarding.**



# Metadata & Documentation: Related?



# Documentation

Lab notebooks

Codebooks

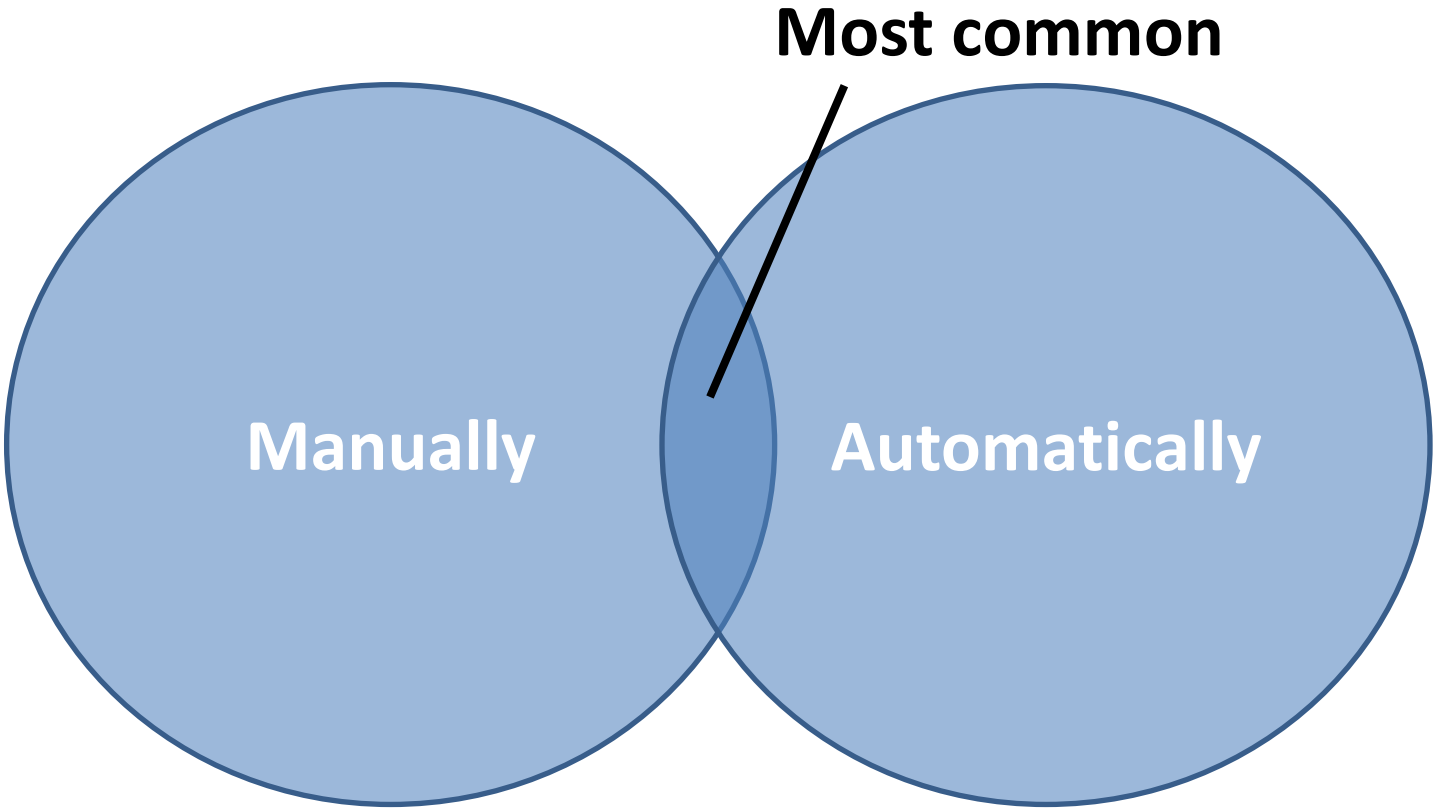
Lab protocols

Grant/research proposals

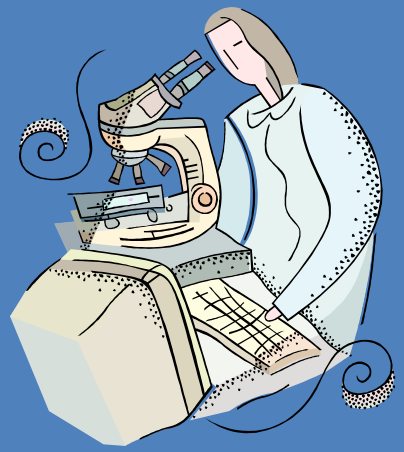
Associated research articles

# From Documentation to Metadata

Metadata can either be added…



# Metadata : Questions



What is produced automatically?

Level 1

Level 2

What is easily transformed into relevant standards?

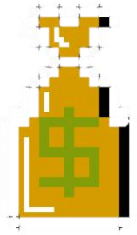
What information is needed to open, understand, & work with the data?

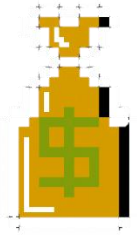
Level 3

# Metadata : Pitfalls

- Rejecting researcher metadata
- Requiring too much of researchers
- Not leveraging existing documentation & expertise
- No easy to understand documentation

# Metadata : Solutions





- Find (and use!) the low-hanging fruit
  - Data Curation Profiles
  - Documentation
- Leverage (human) resources
  - Metadata and cataloging librarians
  - Graduate students
  - Subject Librarians
- Define a core set of metadata for
  - …your library
  - …widely-used disciplinary metadata standards
- Data Curation
  - "Full service" option for researchers

**Level 1** **Level 2** **Level 3**

# Metadata : Requirements

- Data creator name(s)
- Data set title
- File information
  - Format
  - Software required
  - Other technical information
- Methodology
  - How the data was created or collected

## Vortex II Forecast Data - forecast_20100615140000Z_run001

**Plale, Beth; Brewster, Keith; Mattocks, Craig; Bhangale, Ashish; Withana, Eran C.; Herath, Chathura; Terkhorn, Felix; Chandrasekar, Kavitha**

**URI:** http://dx.doi.org/10.5967/M0D21VHV
http://hdl.handle.net/2022/15157
**Date:** 2010-07-28
**Date(s) Covered:** 2010-06-15
14:00:00 hours
**Geographic / Spatial Information:** West: -107.1492, East: -95.65079, North: 39.58868, South: 46.41132
Mike Rd Claude TX 79019 USA
**Methodology:** The input data for this forecast includes the following: Rapid Update Cycle (RUC) data downloaded from NOAA with a 13km resolutionfor forecast date 20100502 at 06Zwith data for hourly offsets from 08 to 22. The file format for this input data is grib. The forecast is initialized based on ARPS Data Analysis System (ADAS) Real-time meteorological data assimilation netgrdbas files with CONUS coverage at 10km resolution produced hourly by CAPS at Oklahoma University that uses the netCDFfile format. The data is for 20100502 at 13Z.
**File Information:** This paricular collection contains namelist.input, cape.zip, radar.zip, precip.zip, surface.zip, updraft_helicity.zip, vorticity.zip, xsec.zip, and wrfout_d01_2010-05-02_13_00_00.nc.namelist is configuration file of WRF. cape is short for Convective Available Potential Energy, a measure of the instability in an air mass. cape.zip is the visualization of cape and contains 24 png files. radar is Mix of radar minimum and radar maximum visualizations. radar.zip represents the mixed results of putting those two radar types together. radar.zip is the visualization of vorticity and contains 28 png files. precip is short for Precipitation, the sum of the rain, snow and hail in given in liquid equivalent depth. precip.zip is the visualization of precip and contains 4 png files. surface is meteorological parameters on the earth's surface, or in a model on the first level above the ground. surface.zip is the visualization of surface and contains 16 png files. updraft_helicity is the dot product of the vertical velocity and the vertical vorticity. It is presented as a summation over a 3-km depth. updraft_helicity.zip is the visualization of updraft_helicity and contains 16 png files. vorticity is the localized rotation of the air. In model plots it is often the vertical component of vorticity, the rotation of the horizontal winds. vorticity.zip is the

**Example of metadata used to describe a data file in IUScholarWorks repository**


SCORE 837170
RINGS 0
DATA PRESERVATION :
THE GOLDEN RING
SONIC
X 2
© SEGA

# Data Preservation & Library Roles


- Dedicated data repository
- Sufficient staffing
- Data curation services

- Leveraged IR & staff
- Consultations & education

- No IR
- Limited/leveraged staff
- Use of 3rd party resources

# Our Library Takes The Role of _____ in Data Preservation

- **Lead hedgehog!**


- **Sidekick**

- **Elusive genius**

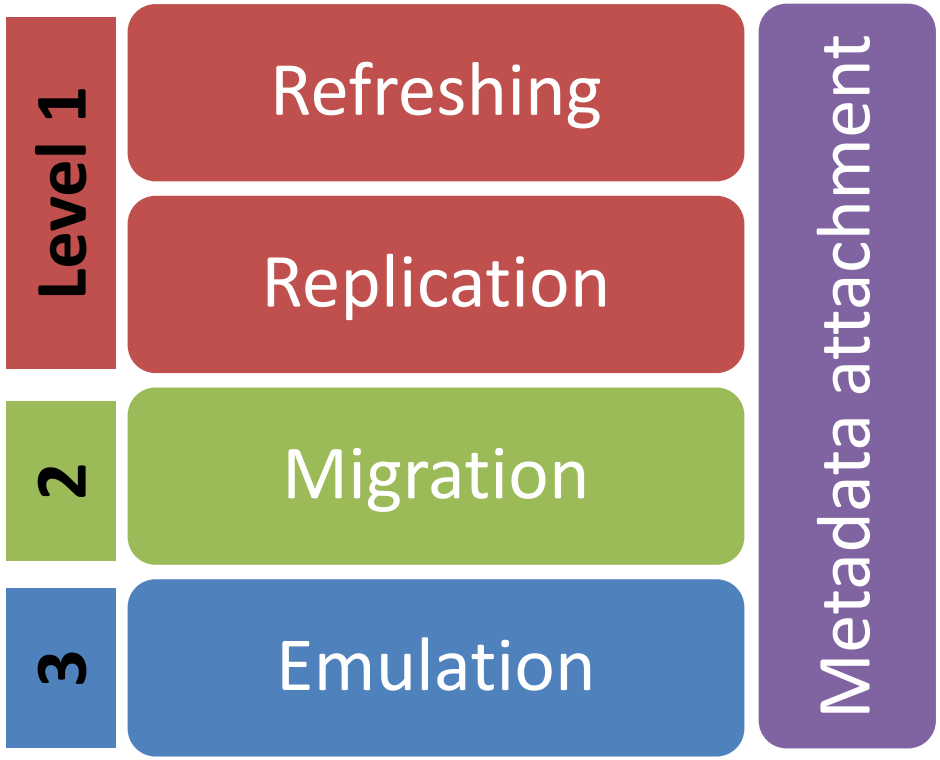
# Data Preservation

- How long?
  - Standards vary from discipline to discipline (and grant-to-grant)
- How much?
- What formats?
- At what cost?

# Data Preservation Challenges

- Was upstream stewardship sufficient?
- Custom and proprietary formats
- Preserving data for emeritus faculty
- Digital data more fragile than analog data in most cases

# Data Preservation

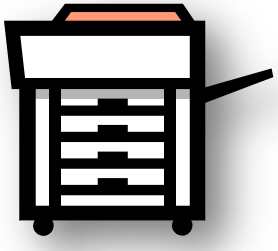



# Data Preservation Options


# Data Preservation : Other Opportunities

Partnerships with Archives

Secured physical storage



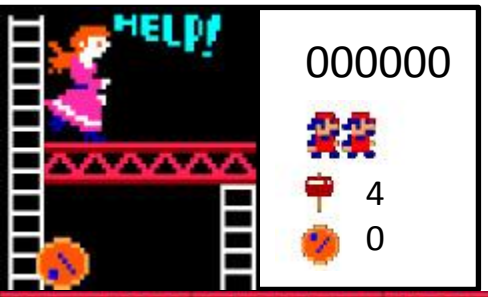
Replicating your institutions digital data

# DATA REPOSITORIES

L=01

## 1. Refer patrons to data repositories

- Find data repositories in Databib
- Many different flavors: publisher (Dryad), consortium (3TU.Datacentrum), instrument (CHANDRA), sub/disciplinary (RKMP), country (Research Data Australia), institutional (PURR), general purpose (FigShare), etc.



Have you ever gotten a reference question that involved a data repository?

YES NO

# 2. Refactor your existing institutional repository

- Extending your digital document repository to include dataset submissions
- For example, IDEALS at the University of Illinois

# 3. Deploy a dedicated data repository

- Design and implement a stand-alone institutional data repository
- For example, the Purdue University Research Repository (PURR)

Do you have a data repository at your institution now?

YES

NO

If not, are you planning to implement one?

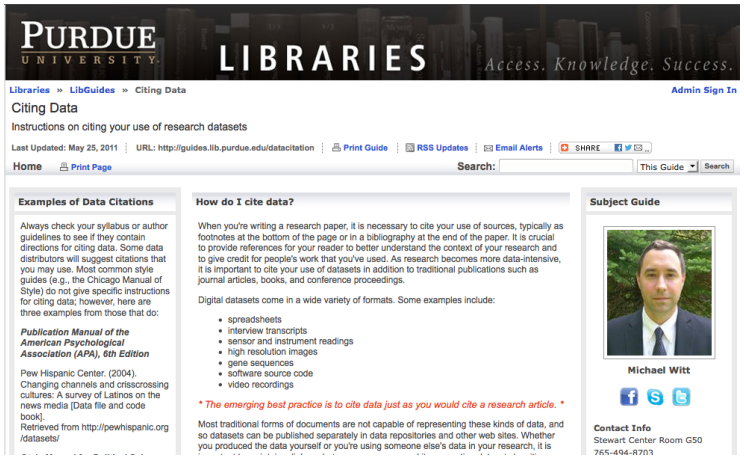
YES

NO

# DATA CITATION

# 1. Instruction

- Information literacy outreach
- libguides





TIME

Do you include citing data in your information literacy outreach or libguides?

YES NO

# DATA CITATION

## 2. Outreach and Advocacy

- Brochure
- Writing Lab
- Press and publishers

# DATA CITATION

## 3. Practice what you preach

- Cite your own data
- Suggest citation for data in your libraries
- Include in supporting documentation
- COiNS, embedded RDF, BibTex, etc.
- Show publications that cite datasets
- DataCite: minting DOIs for datasets


www.DataCite.org

TIME

# Resources


- Tenopir, C., Birch, B., & Allard, S. (2012). Academic Libraries and Research Data Services: Current Practices and Plans for the Future. http://www.ala.org/acrl/sites/ala.org.acrl/files/content/publications/whitepapers/Tenopir_Birch_Allard.pdf
- Bailey, C. (2012). Research Data Curation Bibliography: http://digital-scholarship.org/rdcb/rdcb.htm
- Walters, T., Skinner, K., & Association of Research Libraries. (2011). *New Roles for New Times: Digital Curation for Preservation*. http://www.arl.org/bm~doc/nrnt_digital_curation17mar11.pdf
- Association of Research Libraries. *To Stand the Test of Time: Long-Term Stewardship of Digital Data Sets in Science and Engineering*. http://www.arl.org/bm~doc/digdatarpt.pdf
- Jahnke, L., Asher A., & Keralis, S. (2012). *The Problem of Data*. Council on Library and Information Resources. http://www.clir.org/pubs/reports/pub154
- Borgman, C. L. (2012). The Conundrum of Sharing Research Data. *Journal of the American Society for Information Science and Technology* 63(**6**), 1059-1078. http://ssrn.com/abstract=1869155